

**REMARKS**

This Amendment is being filed in response to the Office Action dated October 8, 2008. In view of these amendments and remarks this application should be allowed and the case passed to issue. No new matter is introduced by this amendment. Support for the amendments is found throughout the specification as originally filed, including page 13.

Claims 1 and 3-31 are pending this application. Claims 7-31 have been withdrawn pursuant to a restriction requirement. Claims 1 and 3-6 are rejected. Claims 1, 5, and 6 have been amended in this response. Claim 2 was previously canceled.

***Claim Rejections Under 35 U.S.C. § 103***

Claims 1 and 3-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over of Ito et al. (US 6,926,982). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the present invention, as claimed, and the cited prior art.

Ito et al. do not suggest the claimed fuel cell system, motor vehicle, and automobile. Ito et al. do not suggest the fuel cell stack comprising a plurality of unit cells, each unit cell including a membrane electrode assembly to generate electricity, the membrane electrode assembly comprising a polymer electrolyte membrane and two electrodes on both sides of and adjacent to the polymer electrolyte membrane, a fuel cell stack anode electrically connected to one of the two electrodes, and a fuel cell stack cathode electrically connected to the other of the two electrodes, wherein each unit cell is immediately adjacent another unit cell; a rechargeable battery electrically connected to the fuel cell stack in a parallel connection in which an anode of the battery is electrically connected to the anode of the fuel cell stack, and a cathode of the battery is electrically connected to the cathode of the fuel cell stack, the battery supplies current

to the unit cells of the fuel cell stack through the parallel connection to allow the unit cells to electrolyze water therein; and a controller programmed to: determine whether or not the fuel cell stack is generating electricity, and supply current to the unit cells of the fuel cell stack from the battery through the parallel connection to allow the unit cells to electrolyze water therein, when generation of electricity by the fuel cell stack is terminated, and supply current from the unit cells through the parallel connection to charge the battery when the fuel cell stack generates electricity, as required by claims 1, 5, and 6.

Specifically, Ito et al. do not suggest each unit cell is immediately adjacent another unit cell and that current is supplied to the unit cells of the fuel cell stack from the **rechargeable** battery through the parallel connection to allow the unit cells to electrolyze water therein, when generation of electricity by the fuel cell stack is terminated, and current is supplied from the unit cells through the parallel connection to charge the **rechargeable** battery when the fuel cell stack generates electricity, as required by claims 1, 5, and 6.

In the present invention the unit cell either generates electricity or hydrolyzes water (though not at the same time) depending on the direction current is flowing. In the present invention, when current flows from the battery the unit cell hydrolyzes water. On the other hand, when the unit cell is generating electricity current flows from the unit cell to the rechargeable battery to charge the battery. The fuel cell system of the present invention does not comprise separate hydrolysis portions and fuel cell portions, as in Ito et al.

As explained in the written description, the present invention hydrolyzes water remaining in the fuel cell after shutdown of electricity generation (pages 2, 7, and 8). Thus, preventing the water from freezing and blocking the gas channels when the fuel cell is used in sub-freezing ambients. There is no suggestion in the prior art of the claimed structure comprising a fuel cell

stack and rechargeable battery. There is no suggestion of using current supplied by the rechargeable battery to hydrolyze water remaining in the fuel cell stack after shutdown of generation to prevent the water from freezing and blocking the gas channels. The present invention solves the long recognized problem of water freezing in the gas channels of the fuel cell.

Ito et al. does not suggest the structure of the claimed fuel cell system. Ito et al. do not suggest a fuel cell stack in which each unit cell is immediately adjacent another unit cell, and a fuel cell system in which current is supplied to the unit cells of the fuel cell stack from the rechargeable battery through the parallel connection to allow the unit cells to electrolyze water therein, when generation of electricity by the fuel cell stack is terminated, and current is supplied from the unit cells through the parallel connection to charge the rechargeable battery when the fuel cell stack generates electricity, as required by claims 1, 5, and 6.

Though the Examiner opined that the fuel cell of Ito et al. can function as a battery, the Examiner-asserted structure would not meet the present claims. In the claimed structure, the battery supplies current to the fuel cell stack when generation of electricity by the fuel cell stack is terminated. The prior art fuel cells cannot store electricity and supply it to the fuel cell stacks when the fuel cell stacks terminate generation of electricity.

The Examiner alleged that the fuel cell in combination with the external circuit serves as electron storage medium which functions as a battery. Fuel cells do circulate electrons through an external circuit like a battery. However, one of skill in the art would readily recognize that such a "battery" would be a current supplying source, not an electron storage medium. Further, one of skill in this art would recognize that a fuel cell and external circuit would not be charged

as a rechargeable battery would be charged. One of skill in this art would not recognize a fuel cell and external circuit as a rechargeable battery.

There is no suggestion in the prior references that a fuel cell and external circuit, and a rechargeable battery are art-recognized equivalents. Fuels cells are not rechargeable. While both are sources of electrical current. Rechargeable batteries can be electrically charged to store energy which can be subsequently used when the batteries are discharged. Fuel cells and external circuits of the prior art are not electrically charged to store energy. In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents. *In re Ruff*, 256 F.2d 590, 118 USPQ 340 (CCPA 1958). The cited art does not recognize rechargeable batteries and fuel cells and external circuits as equivalents.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily available to one of ordinary skill in the art. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006); *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). There is no suggestion in Ito et al. of modifying the fuel cell system of Ito et al. provide a fuel cell stack in which each unit cell is immediately adjacent another unit cell, and a fuel cell system in which current is supplied to the unit cells of the fuel cell stack from the rechargeable battery through the parallel connection to allow the unit cells to electrolyze water therein, when generation of electricity by the fuel cell stack is terminated, and

current is supplied from the unit cells through the parallel connection to charge the rechargeable battery when the fuel cell stack generates electricity, as required by claims 1, 5, and 6, nor does common sense dictate such modifications. The Examiner has not provided any evidence that there would be any obvious benefit in making such modifications to Ito et al. *See KSR Int'l Co. v. Teleflex, Inc.*, 500 U.S. \_\_\_\_ (No. 04-1350, April 30, 2007) at 20.

The only teaching of the claimed fuel cell system is found in Applicant's disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must not be based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The dependent claims are allowable for at least the same reasons as claim 1 and further distinguish the claimed fuel cell system.

In view of the above amendments and remarks, Applicant submits that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

**Application No.: 10/637,660**

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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